FiberOptic Switches Quick Installation Guide

This quick installation guide provides instructions for installing a FiberOptic Switch.

1-1 Introducing the FiberOptic Switches

SIIG's line of fiber optic switches are standard switches that meet all IEEE 802.3u / 802.3X standards. A Fast Ethernet Switch is a cost-effective solution for easing your network congestion problems on existing shared-hub network by breaking up the collision domain and by multiplying the network performance. The overall network transmission speed is increased and the network efficiency is improved to accommodate high-bandwidth applications, such as imaging multimedia, and CAD / CAM, etc.

The following models are available :

- FiberOptic Switch 4000-ST (4 ST fiber ports)
- FiberOptic Switch 4000-SC (4 SC fiber ports)
- FiberOptic Switch 4000-MT (4 MT-RJ fiber ports)
- FiberOptic Switch 8020-ST (8 TP & 2 ST fiber ports)
- FiberOptic Switch 8020-SC (8 TP & 2 SC fiber ports)

Features/Specifications

- **Standards:** IEEE 802.3u and 802.3x 100Base-FX
- **Transmission Mode:** Full or Half-duplex
- **Transmission Speed:** 10 / 100Mbps for TP ports
  100Mbps for fiber ports
- **Packet Forwarding/Filtering Rate:** 148,000 packets / sec full wire rate on 100Mbps forwarding and filtering. 14,880 packets / sec full wire rate on 10Mbps forwarding & filtering
- **MAC Address and Self-learning:** up to 12K
- **Buffer Memory:** 1024KB
- **Flow Control:** IEEE 802.3x compliant for full-duplex; Back pressure flow control for half-duplex

- **Network Interface:**

  Models:

4000-ST :	Four 100Base-FX, ST (multi-mode)
4000-SC:	Four 100Base-FX, SC (multi-mode)
4000-MT:	Four 100Base-FX, MT-RJ (multi-mode)
8020-ST:	Eight 10/100Base-TX; RJ-45 Two 100Base-FX, ST (multi-mode)
8020-SC:	Eight 10/100Base-TX; RJ-45 Two 100Base-FX, SC (multi-mode)

- **Fiber Optic Connector:**
  ST/SC/MT-RJ connector (multi-mode), Tx/Rx
- **Fiber Optic Cable and Maximum Length:**
  50/125, 62.5/125 or 100/140 μm (multi-mode); up to 2000 m
- **TP Connector:** (For models 8020-ST and 8020-SC only)
- **Selectable Duplex Mode Switch:** Per fiber port FDX/HDX DIP switch
- **LED Indicators:**

LED	Color	Function
Link/Act	Green	Lit when remote device connection is good Blinks when any traffic is present
100Mbps	Green	Lit when 100Mbps speed is active
FDX/Col	Amber	Lit when full-duplex mode is active Blinks when collision signal is present
POWER	Green	Lit when AC power is ON and good

- **Power Requirement:**

  AC Voltage: 100~240V

  Frequency: 50~60Hz

  Consumptions: Models 4000-ST/SC/MT: 25W Max.
  Models 8020-ST/SC: 43W Max.
- **Operating Temperature:** 32° to 122° (0° to 50°C)
- **Storage Temperature:** -40° to 158°F (-40° to 70°C)
- **Relative Humidity:** 5% to 90%, non-condensing
- **Dimensions:**

  Models 4000-ST/SC/MT: 45mm (H) x 330 (W) x 200mm (D)
  Models 8020-ST/SC: 46mm (H) x 440 (W) x 220mm (D)

Maximum Fiber Optic Cable Lengths

To help ensure a successful installation, you must observe the following cabling parameter. Violating these rules can render the LAN to work poorly.

Full-duplex Switch via Fiber:		
Multi-mode	Node to Node:	2000 m
	Node to Hub	2000 m
	Hub to Hub:	2000 m
Half-duplex Switch via Fiber:		
Multi-mode	Node to Node:	412 m
	Node to Hub	412 m
	Hub to Hub:	412 m
Half-duplex Class II Hub via Fiber:		
Multi-mode	Node to Node:	205 m
	Node to Hub	100 m
	Hub to Hub:	5 m

Maximum TP Cable Lengths

To help ensure a successful installation, you must observe the following cabling parameter.

Category 5 UTP Cable:		
Multi-mode	Node to Node:	100 m
	Hub to Hub:	100 m

* For connection to Router, Bridge, or regular 100Base-X Hub, please refer to the device's Technical Manual for respective bit-time delay.

Unpacking

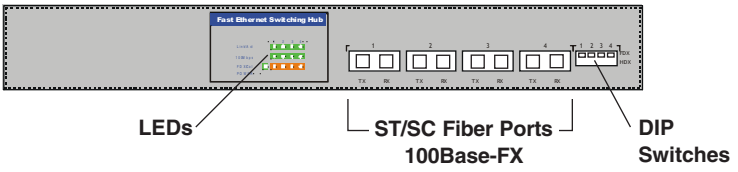
Before installing your FiberOptic Switch, verify that the following items are included in the packaging carton:

- FiberOptic Switch
- Mounting accessory (for 19" rack shelf)
- AC power cord
- This Quick Installation Guide

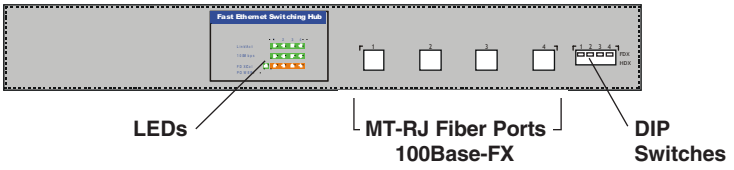
Please notify your dealer if any item is damaged or missing.

2-1 Hardware Installation

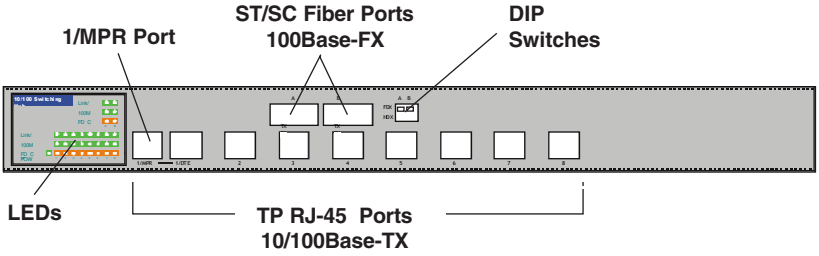
The following figures identify the front panel port, DIP switch and LED locations for the FiberOptic Switch models. Please refer to the appropriate diagram for your model.



4-Port FiberOptic Switch 4000-ST/SC



4-Port FiberOptic Switch 4000-MT



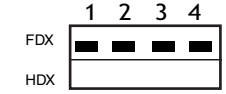
8-Port FiberOptic Switch 8020-ST/SC

2-1.1 Fiber Port Full-/Half-duplex Mode Configuration

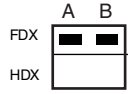
Each fiber port can be independently configured for either full-duplex (FDX) or half-duplex (HDX) mode through DIP switches located on the front panel. *The default setting is Full-duplex.*

- Verify that the duplex mode setting for each fiber port on the Switch hub matches the connected remote device's mode setting (full-duplex to full-duplex, half-duplex to half-duplex).
- The number on the DIP switch corresponds to the fiber port number it sets.

To change a fiber port's mode setting , power down the Switch unit and set the appropriate DIP switch. Then, power ON to set the new configuration and status.



Models 4000-ST/SC/MT



Models 8020-ST/SC

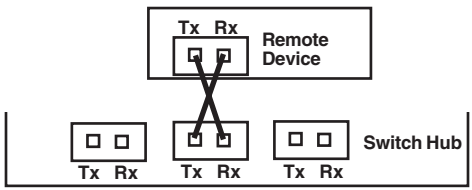
Default DIP Switch Settings

2-1.2 Network Device Connections

Proceed with the following steps to make the network connections:

1. Turn OFF the power to the server / host, workstation or any other device to be connected.
2. Using *Fiber Cable* for 100Base-FX devices and *Cat 5 TP Cable* for 10 / 100Base-TX devices, connect each device to the appropriate fiber / RJ-45 ports on the Switch hub .

   NOTE FOR FIBER CONNECTIONS: When connecting fiber cable, you must make a paired connection to each fiber port. Connect a cable between the selected Switch port's Tx (transmit) port and the remote device's Rx (receive) port. Connect another fiber cable between the Switch port's Rx (receive) port and the device's Tx (transmit) port.



Tx/Rx Fiber Optic Cable Connections

NOTE FOR MODELS 8020-ST/SC: The fiber port can be up-linked to an upper level hub's port. You may use the "1/MPR" port to up-link the hub to an upper level hub's TP port. Only one up-link is allowed between any two hubs.

3. Plug the female end of the AC power cord into the receptacle on the back of the Switch unit. Plug the other end into an AC power source.

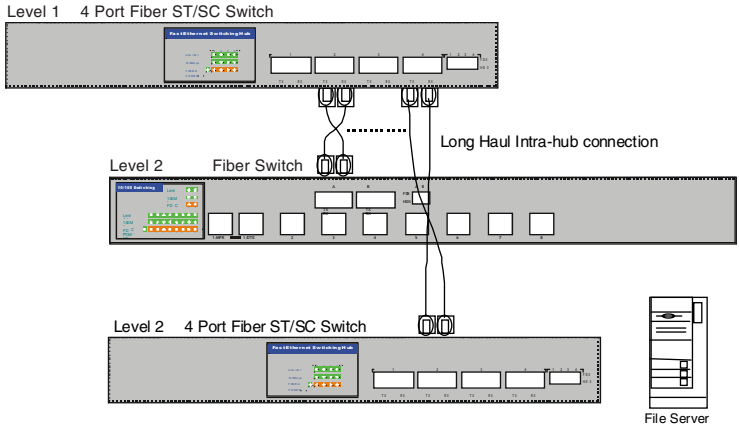
   NOTE: 4000-ST/SC models will automatically power ON when plugged in. The 8020-ST/SC models provide a ON/OFF switch control on the back of the unit.

2-1.3 Switch Hub Cascading & Long Haul Connections

Theoretically, the switch hub breaks up the collision domain in hub cascading so you may unlimitedly up-link the hubs. However, in practice, the network extension (cascading levels & overall diameter) is limited by the timing requirement (time-out specification) of your application software and network operating system.

The sum of all elements' bit-time delay and the overall bit-time delay of wires/devices must be within 512 bit in a 100Base-X network segment (collision domain). The TP, fiber cables and devices' bit-time delay (round trip) is as follows:

100Base-TX		**100Base-FX**	
DTE ↔ DTE:	100	DTE ↔ DTE:	100
Cat. 5 TP Wire:	1.112/m	Fiber Cable:	1.0/m
DTE FX to DTE TX: 100			
100Base-TX to 100Base-FX Converter: 56			


Level 1 4 Port Fiber ST/SC Switch
Long Haul Intra-hub connection
Level 2 Fiber Switch
Level 2 4 Port Fiber ST/SC Switch
File Server

Multiple Hubs Cascading and Long-Haul Connection

3-1 Troubleshooting

Network troubleshooting requires patience and logic. Generally speaking, the cabling and workstation configurations are the likely first suspects; network hardware is usually last on the list. It is more likely for an entire hub to fail instead of just a single port.

3-1.1 Cabling Problems

Network troubleshooting requires patience and logic. Improper Cabling is the primary cause of most non-workstation problems on Ethernet network, particularly for 100 Base-TX and -FX networks. It must be emphasized that genuine twisted-pair cable and fiber optic cable be used to avoid many types of cabling problems.

- Wiring is definitely the problem if the Link LED does not light.
- Multi-mode fiber cable should match the switch's fiber transceiver. Flat telephone extension cables or Cat. 3 wires sold at electronics stores are not the same as Cat. 5 twisted-pair cable and will not work in 100Mbps network.

- If a workstation (workstation A) does not work and other 100Base-X ports on the hub are functioning, remove a fiber / RJ-45 plug from a functioning port with a functioning workstation (workstation B) and insert it into the suspect port. If workstation B still works, the problem is in workstation A or in the wiring. However, if workstation B does not work, then the hub may have a defective port. Even if you suspect a defective port on the hub, continue testing. Improperly wired workstations may appear to be functional, especially if they are located near the hub. Sometimes, a port connected to an improperly wired workstation can function marginally while another port may not work at all.
- Once you have established that the hub is working properly, check all wiring between the hub and the malfunctioning workstation. Ensure that the transmit and receive wires have not been crossed; the two transmit wires should be paired together as should the two receive wires.
- Use a continuity checker to ensure that wires do not have breaks. By shorting together the two wires of a pair at one end, you can use the continuity checker at the other end. Also, check that there are no shorts between wires.

3-1.2 Workstation Problems

Most non-cabling problems result from improper configuration of the network interface card (NIC) and its corresponding driver. The following points will be helpful:

- Like other add-on cards in the workstation or server, NIC must have unique memory address, I/O address, and interrupt. The settings on a particular card must not conflict with the settings on any other card in the same station. Please refer the User's manual of the NIC, computers, and Networking operating systems to determine the proper configuration.
- The selection of half or full duplex, the speed of 10 or 100Mbps for the NIC setting must match the mode and speed setting of the corresponding port of the Hub. For NWay Auto-Negotiation setting, both link partners will auto-adjust to the highest allowable speed and mode operation.

3-1.3 Other Problems

Other specific problems may be diagnosed by using the LEDs, as below.

Power LED is off when the AC Power switch is ON:

- Defective power supply unit or fuse
- Incorrect AC voltage
- Defective Hub

Link/Act LED is off at any Fiber/TP port:

- Faulty node or wiring connection.

  For fiber: the "TX", "RX" cables should be paired at both ends

  For TP: a clicking sound should be heard when the RJ-45 plug is inserted in the STP RJ-45 jack
- No Link signal is received from the remote node / site

100Base-X Port at irregular traffic:

- Abnormal or invalid transmission status (mode / speed) between local and remote link partners, i.e., full-duplex port is connecting to a half-duplex port, or 10Mbps port is connecting to a 100Mbps device.

Hub does not work:

If the hub does not work or is experiencing interference (e.g., your site may be located near radio station or transmitter, etc.), try using shielded twisted-pair (STP) cable instead of UTP cable.

Hub Diagnostic Test

- The switch hub performs a self-diagnostic test at major hub modules upon power on, LED indicators will go to normal status if no problem occurred.
- To reset or restart the hub, power off the hub and wait for 10 seconds, then power on it again.

4-1 Technical Support & RMA

Questions? SIIG's **On-line Support** has the answers! Simply visit our web site at ***www.siig.com*** and click on the **ON-LINE SUPPORT** icon for instant technical support. You may also e-mail us on-line at: **http:\www.siig.com/technical_support_form.html**

If you need additional help, Tech Support Specialists are available from 8:00 a.m. to 5:00 p.m. Mon. – Fri., PST at **(510) 353-7542.**

In order for SIIG's Technical Support to give you prompt service, you will need the following information.

Part Number: _____

Computer Configuration: _____

Return Merchandise Authorization (RMA)

SIIG warrants to the original buyer of the product that the hardware is free of defects in materials and workmanship for a period of five years from the date of purchase. If your product fails to be in good working order during the warranty period, you may return it to SIIG for repair or replacement at SIIG's option. To return a product:

Step 1: Call SIIG's RMA Department

Call the RMA Department at **(510) 413-5333** for a Return Merchandise Authorization (RMA) number. **To get a RMA number, you must have your product serial number. The serial number is located on the side of the box it came in and on the back of the product.**

Step 2: Complete the RMA form

- Fill out the RMA form and include it with the product.
- Properly pack the product for shipping. All software, cable(s) and accessories that came with the original package must be included.
- Clearly write your RMA number on the top of the returned package and on the accompanying RMA form. SIIG **will refuse any shipping package, and not be responsible for a product returned without a RMA number posted on the outside of the shipping carton.**

Step 3: Ship the product

You are responsible for the shipping cost to SIIG at the following address:

SIIG, Inc. RMA#_____
6078 Stewart Ave.
Fremont, CA 94538

SIIG will ship the repaired or replaced product via UPS Ground or US Mail at no cost to you.